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Biographical Notes

Citizenship: American & Canadian
Date of birth: March 22, 1960
Current status: Physicist, Brookhaven National Laboratory

Education

Doctor of Philosophy, Physics (August, 1990)

University of British Columbia, Vancouver, British Columbia, Canada

Field of Study: Experimental condensed matter physics (optical properties of solids)

Thesis title: *The optical properties of $(\text{TMTSF})_2\text{ReO}_4$ and $(\text{TMTSF})_2\text{BF}_4$ above and below their metal-insulator transitions.*

Supervisor: Prof. J.E. Eldridge

Master of Science, Physics (November, 1985), University of British Columbia

Thesis title: *The powder absorption spectra of some bis-tetramethyltetraselenafulvalene salts $[(\text{TMTSF})_2X$, $X=(\text{PF}_6, \text{AsF}_6, \text{SbF}_6, \text{BF}_4, \text{ClO}_4, \text{and ReO}_4)]$.*

Supervisor: Prof. J.E. Eldridge

Bachelor of Science (Hons.), Physics (May, 1983)

McMaster University, Hamilton, Ontario, Canada

Research Experience

- 2003- **Physicist (tenure)**, *Infrared Spectroscopy (Electron Spectroscopy Group)*
- 2001-2003 **Physicist**, *Infrared Spectroscopy (Electron Spectroscopy Group)*
- 1998-2001 **Associate Physicist**, *Infrared Spectroscopy (Electron Spectroscopy Group)*
- 1996-1998 **Assistant Physicist**, *Infrared Spectroscopy (Electron Spectroscopy Group)*
Optical properties of solids, UHV thin films techniques, solvated electron systems, transition metal oxides ("bad metals"), colossal magnetoresistance, high-temperature superconductivity, and synchrotron radiation sources and techniques. Local contact for U10A.
Department of Physics & National Synchrotron Light Source
Brookhaven National Laboratory, Upton, NY
- 1994-1996 **Research Associate**, Prof. B.P. Clayman
Optical properties of solids, semiconductors, High- T_c superconductors, C_{60} . Instrumentation development, optical cryogenic and vacuum engineering, and application development.
Department of Physics
Simon Fraser University
- 1992-1994 **NSERC Post-Doctoral Fellow**, Profs. B.P. Clayman and M.W.L. Thewalt, in collaboration with Prof. T. Timusk at McMaster University (CIAR)
Optical properties of superconductors and correlated systems.
Department of Physics
Simon Fraser University, Burnaby, B.C.
- 1990-1992 **Post-Doctoral Research Fellow**, Prof. Tom Timusk
Optical properties (IR, visible and UV) of solids; high-temperature superconductivity; quasicrystals; metallic glasses; electron-phonon coupling in low-dimensional systems; instrumentation and software development.
Department of Physics & Astronomy

- McMaster University, Hamilton, Ontario.
- 1984-1990 **Graduate Research Assistant**, Prof. J.E. Eldridge
Optical properties of solids; models of optical conductivity; synthesis and study of organic conductors; group theory; instrumentation development.
 Department of Physics & Astronomy
 University of British Columbia, Vancouver, B.C.
- 1983 **NSERC Summer Research Assistant**, Prof. J.A. Cameron
Perturbed angular correlation in Heusler alloys; Mössbauer effect; isotope production; instrumentation design and data acquisition
 Department of Physics, McMaster University
- 1982 **NRC Summer Research Assistant**, Dr. T.J. Hughes
Ionospheric physics; field continuation theory
 Herzberg Institute of Astrophysics
 Solar-Terrestrial Physics Section
 National Research Council of Canada, Ottawa, Ontario.

Professional Experience

- 1995-1999 **Idelix™ Software Ltd.**, co-founder and officer of the company until 1999. IDELIX™ Software is a Vancouver-based software company focused on improving the presentation of data and images on computing devices through innovations in Information Visualization. Idelix Software's products provide a solution to the "screen real estate" problem and facilitate business decision-making. The company currently consists of approximately 20 staff members.

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Teaching Experience

- 1996 **Lecturer**
 Physics 120 – *Modern Physics and Mechanics*
 Simon Fraser University, Burnaby, B.C.
- 1990-1996 **Laboratory Research Supervisor**
Graduate Research (Masters and Doctoral students)
 McMaster & Simon Fraser University
- 1991-1992 **Research Supervisor**
High School Cooperative Education Program
 Hamilton-Wentworth Separate School Board, Hamilton, Ontario
- 1983-1990 **Teaching Assistant**
Demonstrator – Senior Physics Optics and Electronics Labs
Marker – Senior Solid State and Nuclear Physics
 Department of Physics, University of British Columbia

Books and Book Chapters

Peter R. Griffiths and Christopher C. Homes, *Instrumentation for Far-Infrared Spectroscopy*, Wiley Reference Works - Handbook of Vibrational Spectroscopy, Volume 1 - Theory and Instrumentation (Wiley, New York, 2001).

Refereed Publications

1. C.C. Homes, S.V. Dordevic, D.A. Bonn, R. Liang and W.N. Hardy, *Conductivity sum rules and energy scales in the high-temperature superconductors $\text{Yb}_2\text{Cu}_3\text{O}_{6+x}$* , submitted to Phys. Rev. B, cond-mat/0303506.

2. C.C. Homes, J.J. Tu and M. Strongin, *Comment on “Sum rules and electrodynamics of high- T_c cuprates in the pseudogap state”*, submitted to Phys. Rev. B.
3. C.C. Homes, J.M. Tranquada, Q. Li, A.R. Moodenbaugh, and D.J. Buttrey, *Mid-infrared conductivity from mid-gap states associated with charge stripes*, Phys. Rev. B **67**, 184516 (2003), cond-mat/0207003.
4. N. L. Wang, P. Zheng, T. Feng, G. D. Gu, C. C. Homes, J. M. Tranquada, B. D. Gaulin, and T. Timusk, *Infrared properties of $\text{La}_{2-x}(\text{Ca},\text{Sr})_x\text{CaCu}_2\text{O}_{6+\delta}$ single crystals*, Phys. Rev. B **67**, 134526 (2003).
5. T. Timusk and C.C. Homes, *The role of magnetism in forming the c-axis spectral peak at 400 cm^{-1} in high temperature superconductors*, Solid State Commun. **126**, 63-69 (2003).
6. C.C. Homes, T. Vogt, S.M. Shapiro, S. Wakimoto, M.A. Subramanian, and A.P. Ramirez, *Charge transfer in the high dielectric constant materials $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ and $\text{CdCu}_3\text{Ti}_4\text{O}_{12}$* , Phys. Rev. B **67**, 092106 (2003).
7. J. J. Tu, C.C. Homes and M. Strongin, *Optical properties of ultra thin films: evidence for a dielectric anomaly at the insulator to metal transition*, Phys. Rev. Lett. **90**, 017402 (2003).
8. C.C. Homes, Q. Li, P. Fournier, and R.L. Greene, *Optical properties of Pr_2CuO_4* , Phys. Rev. B **66**, 144511 (2002).
9. G. Tzamalís, N.A. Aaidi, C.C. Homes, and A.P. Monkman, *Doping dependent studies of the Anderson-Mott localization in polyaniline at the metal-insulator boundary*, Phys. Rev. B **66**, 085202 (2002).
10. Lixin He, J.B. Neaton, Morrell H. Cohen, David Vanderbilt, and C.C. Homes, *A first principles study of the structure and lattice dielectric response of $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$* , Phys. Rev. B **65**, 214112 (2002).
11. S.V. Dordevic, E.J. Singley, D.N. Basov, S. Komiyá, X.F. Sun, Y. Abe, Y. Ando, E. Bucher, C.C. Homes, and M. Strongin, *Global trends in the interplane penetration depth of layered superconductors*, Phys. Rev. B **65**, 134511 (2002).
12. J.J. Tu, C.C. Homes, G.D. Gu, D.N. Basov, S.M. Loureiro, R.J. Cava, and M. Strongin, *Optical studies of charge dynamics in the optimally-doped $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ and the non-superconducting $(\text{Bi}_{0.5}\text{Pb}_{0.5})_2\text{Ba}_3\text{Co}_2\text{O}_\delta$ single crystals*, Phys. Rev. B **66**, 144514 (2002).
13. J.J. Tu, C.C. Homes, G.D. Gu, and M. Strongin, *A systematic study of phonon properties in optimally-doped $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$* , Physica B **316-317**, 324-327 (2002).
14. D.N. Basov, A.M. Bratkovsky, P.F. Henning, B. Zink, F. Hellman, Y.J. Wang, C.C. Homes, and M. Strongin, *Infrared probe of metal-insulator transition in $\text{Si}_{1-x}\text{Gd}_x$ and $\text{Si}_{1-x}\text{Y}_x$ amorphous alloys in magnetic field*, Europhys. Lett. **57**, 240-246 (2002) (cond-mat/0104245).
15. C. Bernhard, T. Holden, J. Humlicek, D. Munzar, A. Golnik, M. Klasner, Th. Wolf, L. Carr, C. Homes, B. Keimer, and M. Cardona, *In-plane polarized collective modes in detwinned $\text{YBa}_2\text{Cu}_3\text{O}_{6.95}$ observed by spectral ellipsometry*, Solid State Commun. **121**, 93-97 (2002).
16. K.H. Michaelian, R.S. Jackson and C.C. Homes, *Synchrotron infrared photoacoustic spectroscopy*, Rev. Sci. Instrum. **72**, 4331 (2001).
17. J.J. Tu, G.L. Carr, V. Perebeinos, C.C. Homes, M. Strongin, P.B. Allen, W.N. Kang, Eun-Mi Choi, Hyeong-Jin Kim, and Sung-Ik Lee, *Optical properties of c-axis oriented superconducting MgB_2 thin films*, Phys. Rev. Lett. **87**, 277001 (2001), (4 pages).
18. C.C. Homes, T. Vogt, S.M. Shapiro, S. Wakimoto, and A.P. Ramirez, *Optical response of high-dielectric-constant perovskite-related oxide*, Science **293**, 673-676 (2001).

19. G. Tzamalīs, N.A. Zaidi, C.C. Homes, and A.P. Monkman, *Infrared optical properties of polyaniline doped with 2-acrylamido-2-methyl-1-propanesulphonic acid (AMPSA)*, J. Phys.: Condens. Matter **13**, 6297 (2001).
20. J.M. Pigos, B.R. Jones, Z.-T. Zhu, J.L. Musfeldt, C.C. Homes, H.-J. Koo, M.L. Whangbo, J.A. Schlueter, B.H. Ward, H.H. Wang, U. Geiser, J. Mohtasham, R. W. Winter, and G.L. Gard, *Infrared and optical properties of β' -(ET) $_2$ SF $_5$ CF $_3$ SO $_3$: Evidence for a 45 K spin-Peierls transition*, Chem. Mater. **13**, 1326-1333 (2001).
21. D. N. Basov, C.C. Homes, E. J. Singley M. Strongin, T. Timusk, G. Blumberg, and D. van der Marel, *Unconventional energetics of the pseudogap state and superconducting state in high- T_c cuprates*, Phys. Rev. B **63**, 134514 (2001), (9 pages).
22. R.S. Jackson, K.H. Michaelian, and C.C. Homes, *Photoacoustic spectroscopy using a synchrotron light source*, in *Fourier Transform Spectroscopy*, OSA Technical Digest (Optical Society of America, Washington DC, 2001), pp. 161-163.
23. C.C. Homes, A.W. McConnell, B.P. Clayman, D.A. Bonn, Ruixing Liang, W.N. Hardy, M. Inoue, H. Negishi, P. Fournier, and R.L. Greene, *Phonon screening in high-temperature superconductors*, Phys. Rev. Lett. **84**, 5391-5394 (2000).
24. G. Cao, J.E. Crow, R.P. Guertin, P.F. Henning, C.C. Homes, M. Strongin, D.N. Basov, and E. Lochner, *Charge density wave formation accompanying ferromagnetic ordering in quasi-one-dimensional BaIrO $_3$* , Solid State Commun. **113**, 657-662 (2000).
25. P.F. Henning, C.C. Homes, S. Maslov, G.L. Carr, D.N. Basov, B. Nikolic, and M. Strongin, *Infrared studies of the onset of conductivity in ultrathin Pb films*, Phys. Rev. Lett. **83**, 4880-4883 (1999).
26. C.C. Homes, D.A. Bonn, Ruixing Liang, W.N. Hardy, D.N. Basov, T. Timusk, and B.P. Clayman, *Effect of Ni impurities on the optical properties of YBa $_2$ Cu $_3$ O $_{6+y}$* , Phys. Rev. B **60**, 9782-9792 (1999).
27. V. Golovanov, L. Mihaly, C.C. Homes, W.H. McCarroll, K.V. Ramanujachary, and M. Greenblatt, *Temperature and magnetic field dependent optical spectral weight in the cation-deficient colossal-magnetoresistance material La $_{0.936}$ Mn $_{0.982}$ O $_3$* , Phys. Rev. B **59**, 153-156 (1999).
28. J.P. Franck, I. Isaac, Weimin Chen, J. Chrzanowski, J.C. Irwin, and C.C. Homes, *Isotope studies of the CMR compounds La $_{1-x}$ Ca $_x$ MnO $_{3+\delta}$* , J. Superconductivity **12**, 263-267 (1999).
29. D.A. Crandles, B. Nicholas, C. Dreher, C.C. Homes, A.W. McConnell, B.P. Clayman, W.H. Gong, and J.E. Greedan, *Optical properties of highly reduced SrTiO $_{3-x}$* , Phys. Rev. B **59**, 12842-12846 (1999).
30. D.N. Basov, S.I. Woods, A.S. Katz, E.J. Singley, R.C. Dynes, M. Xu, D.G. Hinks, C.C. Homes, and M. Strongin, *Sum rules and interlayer conductivity of High- T_c cuprates*, Science **283**, 49-53 (1999).
31. A.W. McConnell, B.P. Clayman, C.C. Homes, M. Inoue, and H. Negishi, *Polarized reflectance measurements of the CDW transitions in η -Mo $_4$ O $_{11}$ and γ -Mo $_4$ O $_{11}$* , Phys. Rev. B **58**, 13565-13573 (1998).
32. C.C. Homes, J.L. Peng, R.L. Greene, and B.P. Clayman, *Optical conductivity of Nd $_{1.85}$ Ce $_{0.15}$ CuO $_4$: strength of the condensate*, J. Phys. Chem. Solids **59**, 1979-1981 (1998).
33. C.C. Homes, S. Kamal, D.A. Bonn, Ruixing Liang, W.N. Hardy, and B.P. Clayman, *Determination of the condensate from optical techniques in unconventional superconductors*, Physica C **296**, 230-240 (1998).
34. C.C. Homes, B.P. Clayman, J.L. Peng, and R.L. Greene, *Reply to Comment on 'Optical Properties of Nd $_{1.85}$ Ce $_{0.15}$ CuO $_4$ '*, Phys. Rev. B **58**, 14623-14624 (1998).
35. C.C. Homes, B.P. Clayman, J.L. Peng and R.L. Greene, *Optical properties of Nd $_{1.85}$ Ce $_{0.15}$ CuO $_4$* , Phys. Rev. B **56**, 5525-5534 (1997).

36. J.E. Eldridge, Y. Lin, C.C. Homes, H.H. Wang, J.M. Williams, A.M. Kiri, and J.A. Schlueter, *Infrared and Raman studies of the organic superconductor κ -(BEDT-TTF)₂[Cu(NCS)₂] and its ¹³C(4) isotopic analog*, Spectrochim. Acta. **53A**, 565-573 (1997).
37. D.A. Bonn, S. Kamal, A. Bonakdarpour, Ruixing Liang, W.N. Hardy, C.C. Homes, D.N. Basov, and T. Timusk, *Surface Impedance Studies of YBCO*, Czech. J. Phys. **46**, 3195-3202 (1996).
38. C.C. Homes, P.J. Horoski, B.P. Clayman, M.L.W. Thewalt, and T.R. Anthony, *The effects of isotopic disorder on the F_u modes in crystalline C_{60}* , Phys. Rev. B **52**, 16892-16900 (1995).
39. T. Timusk, D.N. Basov, C.C. Homes, A.V. Puchkov, and M. Reedyk, *Gap states in HTSC by infrared spectroscopy*, J. Superconductivity **8**, 437 (1995).
40. C.C. Homes, T. Timusk, R. Liang, D.A. Bonn and W.N. Hardy, *Optical properties along the c-axis of $YBa_2Cu_3O_{6+x}$ for $x=0.5 \rightarrow 0.95$: evolution of the pseudogap*, Physica C **254**, 265-280 (1995).
41. T. Timusk, D.N. Basov, and C.C. Homes, *The strange interplane conductivity of HTSC*, J. Phys. Chem. Solids **56**, 1821-1823 (1995).
42. C.C. Homes, T. Timusk, D.A. Bonn R. Liang, and W.N. Hardy, *Optical phonons polarized along the c-axis of $YBa_2Cu_3O_{6+x}$ for $x=0.5 \rightarrow 0.95$* , Can. J. Phys. **73**, 663-675 (1995).
43. C.C. Homes, M. Ziaei, B.P. Clayman, J.C. Irwin, and J.P. Franck, *Softening of a Reststrahlen band in CuO near the Néel transition*, Phys. Rev. B **51**, 3140-3150 (1995).
44. J.E. Eldridge, C.C. Homes, H. Hau Wang, A.M. Kiri, and J.M. Williams, *The assignment of the normal modes of BEDT-TTF using the infrared and Raman spectra of several isotopic analogs*, Spectrochim. Acta. **51A**, 947-960 (1995).
45. C.C. Homes, P.J. Horoski, M.L.W. Thewalt, and B.P. Clayman, *Anomalous splitting of the F_{1u} ($\rightarrow 3F_u$) vibrations in single-crystal C_{60} below the orientational-ordering transition*, Phys. Rev. B **49** (Rapid Commun.), 7052-7055 (1994).
46. C.C. Homes, T. Timusk, R. Liang, D.A. Bonn and W.N. Hardy, *Optical properties along the c-axis of $YBa_2Cu_3O_{6.70}$: evidence for a pseudogap*, Phys. Rev. Lett. **71**, 1645-1648 (1993).
47. C.C. Homes, J.L. Musfeldt, D.B. Tanner, *Electron-phonon coupling in the quarter-filled TCNQ salt $NPrQ(TCNQ)_2$* , Phys. Rev. B **48**, 16799 (1993).
48. X. Wu, C.C. Homes, T. Timusk, S.L. Cooper, F.S. Pierce, and S.J. Poon, *Optical conductivity of the icosahedral quasicrystal $Al_{75.5}Mn_{20.5}Si_4$ and its 1/1 crystalline approximant α - $Al_{72.5}Mn_{17.4}Si_{10.1}$* , J. Phys: Condens. Matter **5**, 5975-1990 (1993).
49. C.C. Homes, M. Reedyk, D.A. Crandles, and T. Timusk, *Technique for measuring the absolute reflectance of irregular, submillimeter sized samples*, Appl. Opt. **32**, 2976-2983 (1993).
50. J.L. Musfeldt, D.B. Tanner, C.C. Homes, M. Almeida, *Temperature dependence of the infrared and optical properties of N-dimethylthiomorpholinium(TCNQ)₂*, Phys. Rev. B **46**, 8777-8789 (1992).
51. C.C. Homes, X. Wu, T. Timusk, Z. Altounian, A. Sahnoune, and J.O. Ström-Olsen, *The optical conductivity of the stable icosahedral quasicrystal $Al_{63.5}Cu_{24.5}Fe_{12}$* , Phys. Rev. Lett. **67**, 2694-2696 (1991).
52. J.E. Eldridge and C.C. Homes, *Vibrational assignments in the conductivity spectra of semiconducting $(TMTSF)_2ReO_4$ and $(TMTSF)_2BF_4$ (where TMTSF is tetramethyltetraselenafulvalene) for radiation polarized perpendicular to the chains*, Phys. Rev. B **43**, 13971-13977 (1991).

53. C.C. Homes and J.E. Eldridge, *Infrared optical properties of $(\text{TMTSF})_2\text{ReO}_4$ and $(\text{TMTSF})_2\text{BF}_4$ (where TMTSF is tetramethyltetraselenafulvalene) compared with several model calculations*, Phys. Rev. B **42**, 9522-9533 (1990).
54. K.E. Kornelsen, J.E. Eldridge, C.C. Homes, H.H. Wang, and J.M. Williams, *Optical properties of the 10 K organic superconductor $(\text{BEDT-TTF})_2[\text{Cu}(\text{SCN})_2]$* , Solid State Commun. **72**, 475-480 (1989).
55. C.C. Homes and J.E. Eldridge, *Lattice-mode coupling to the charge-density wave in $(\text{TMTSF})_2\text{ReO}_4$ (where TMTSF is tetramethyltetraselenafulvalene)*, Phys. Rev. B **40**, 6138-6143 (1989).
56. J.E. Eldridge and C.C. Homes, *Low temperature, small-sample reflectivity measurements in a commercial rapid-scan Michelson interferometer*, Infrared Phys. **29**, 143-148 (1989).
57. J.E. Eldridge, C.C. Homes, Frances E. Bates, and G.S. Bates, *Far-infrared powder absorption measurements of some tetramethyltetraselenafulvalene salts $[(\text{TMTSF})_2X]$* , Phys. Rev. B **32**, 5156-5162 (1985).

Non-refereed Publications

Conference Proceedings

1. C.C. Homes, J.J. Tu, M. Strongin, A.W. McConnell, B.P. Clayman, D.A. Bonn, Ruixing Liang, W.N. Hardy, M. Inoue, H. Negishi, P. Fournier, and R.L. Greene, *The role of phonons in high-temperature superconductivity – is there one?*, Proceedings of the International Conference on the Low Energy Electrodynamics in Solids (LEES 02), Montauk (Long Island), NY, October 13-18, 2002.
http://solidstate.physics.sunysb.edu/lees2002/speakers/homes/homes_phonons.pdf
2. W.N. Hardy, S. Kamal, R. Liang, D.A. Bonn, C.C. Homes, D.N. Basov, and T. Timusk, *Microwave measurements of the penetration depth in High- T_c single crystals*, 10th Anniversary HTS Workshop on Physics, Materials and Applications, Houston, TX, Mar. 12-16, 1996 (World Scientific, Singapore, 1996), pp. 223-227.
3. C.C. Homes, Q. Song, B.P. Clayman, R. Liang, D.A. Bonn, and W.N. Hardy, *The effect of Ni doping on the optical conductivity of $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$* , Spectroscopic Studies of Superconductors, San Jose, CA, Jan. 29 - Feb. 1, 1996. SPIE Proceedings Vol. **2696**, 101-106 (1996).
4. T. Timusk, N. Cao, D.N. Basov, and C.C. Homes, *The unconventional electrodynamics of High- T_c and organic superconductors*, Spectroscopic Studies of Superconductors, San Jose, CA, Jan. 29-Feb. 1, 1996. SPIE Proceedings, Vol. **2696**, 2-12 (1996).
5. T. Timusk, D.N. Basov, C.C. Homes, A.V. Puchkov, and M. Reedyk, *Gap states in HTSC by infrared spectroscopy*, University of Miami Workshop on High-Temperature Superconductivity, Coral Gables, FL, Jan. 5-11, 1995, J. Superconductivity **8**, 437-440 (1995).
6. T. Timusk, C.C. Homes and W. Reichardt, *The role of c-axis polarized phonons in high-temperature superconductors*, International Workshop on the Anharmonic Properties of High- T_c Cuprates, Bled, Slovenia, September 1-6, 1994, to be published by World Scientific, Singapore, edited by G. Runai.
7. J.E. Eldridge, C.C. Homes, H.H. Wang, A.M. Kini, and J.M. Williams, *Frequencies of fundamental vibrations of BEDT-TTF, using infrared and Raman spectra of ^{13}C , ^{34}S and ^2H substituted molecules*, Synthetic Metals **70**, 983-984 (1995).
8. K. Kamarás, D. van der Marel, C.C. Homes, and T. Timusk, *The use of far-infrared ellipsometry in the study of high-temperature superconductors: possibilities and limitations*, Materials and Mechanisms of

- Superconductivity/High Temperature Superconductors, Grenoble, France, June 4-9, 1994, *Physica C* **235-240**, 1085-1086 (1994) Part II.
9. T. Timusk, C.C. Homes, N. Cao, and D.B. Tanner, *Anisotropic optical conductivity of $YBa_2Cu_3O_{7.8}$* *Beijing International Conference on Superconductivity*, edited by Z.Z. Gan, S.S. Xie, and Z.X. Zhao (World Scientific, Singapore, 1993), pp. 408-415.
 10. Sahnoune, J.O. Ström-Olsen, Z. Altounian, C.C. Homes, T. Timusk, and X. Wu, *Electronic properties of icosahedral $Al_{63.5}Cu_{24.5}Fe_{12}$* , *Fourth International Conference on Quasicrystals*, St. Louis, MO, May 31 - June 5, 1992. *J. Non-Cryst. Solids* **153-154**, 343-346 (1992).
 11. C.C. Homes and J.E. Eldridge, *The infrared conductivities of semiconducting $(TMTSF)_2ReO_4$ and $(TMTSF)_2BF_4$, compared with several model calculations*, *Organic Superconductivity*, edited by V.Z. Kresin and W.A. Little (Plenum Press, New York, 1990), pp. 89-98.
 12. C.C. Homes and J.E. Eldridge, *The optical properties of $(TMTSF)_2ReO_4$ and $(TMTSF)_2BF_4$ through the metal-insulator transition for E_{II}* , *Synthetic Metals* **27**, **B49-B55** (1988).

Abstracts for Conference Presentations

1. C.C. Homes, *Optical properties of the giant dielectric material $CaCu_3Ti_4O_{12}$ and $CdCu_3Ti_4O_{12}$* , *Bull. Am. Phys. Soc.* **47**, 312 (2002). March Meeting of the American Physical Society, Indianapolis, IN, March 18-22, 2002.
2. Lixin He, J.B. Neaton, M.H. Cohen, D. Vanderbilt, and C.C. Homes, *A first principles study of the structure and lattice dielectric response of $CaCu_3Ti_4O_{12}$* , *Bull. Am. Phys. Soc.* **47**, 135 (2002). March Meeting of the American Physical Society, Indianapolis, IN, March 18-22, 2002.
3. J.J. Tu, G.L. Carr, C.C. Homes, M. Strongin, P.B. Allen, and Sing-Ik Lee, *Optical properties of c -axis oriented superconducting MgB_2 thin films*, *Bull. Am. Phys. Soc.* **47**, 504 (2002). March Meeting of the American Physical Society, Indianapolis, IN, March 18-22, 2002.
4. L.M. Miller, G.L. Carr, C.C. Homes, R.P.S.M. Lobo, D.H. Reitze, J.D. La Veigne, D.B. Tanner, D. Talbayev, and L. Mihaly, *New infrared facilities at the National Synchrotron Light Source*, *Bull. Am. Phys. Soc.* **47**, 1003 (2002). March Meeting of the American Physical Society, Indianapolis, IN, March 18-22, 2002.
5. W. Si, E. Cruz, C.C. Homes, P.D. Johnson, and A.P. Ramirez, *Epitaxial thin films of the high-dielectric constant material $CaCu_3Ti_4O_{12}$* , *Bull. Am. Phys. Soc.* **47**, 894 (2002). March Meeting of the American Physical Society, Indianapolis, IN, March 18-22, 2002.
6. D. Vanderbilt, L. He, J.B. Neaton, M.H. Cohen, and C.C. Homes, *Theory of the dielectric response of $CaCu_3Ti_4O_{12}$* , *Fundamental Physics of Ferroelectrics 2002*, Washington, DC, February 3-6, 2002.
7. J.J. Tu, C.C. Homes, M. Strongin, D.N. Basov, G.D. Gu, *The absence of superfluid response in the optical conductivity of the edge region of optimally doped $Bi_2Sr_2CaCu_2O_{8+\delta}$ Crystals*, *Bull. Am. Phys. Soc.* **46**, 270 (2001). March Meeting of the American Physical Society, Seattle, WA, March 12-16, 2001.
8. L. Mihaly, G. Mihaly, I. Kezsmarki, L. Forro, H. Berger, C.C. Homes, G.L. Carr, *Optical properties of barium vanadium sulfide*, *Bull. Am. Phys. Soc.* **46**, 316 (2001). March Meeting of the American Physical Society, Seattle, WA, March 12-16, 2001.
9. A.A. Sirenko, P.C. Eklund, C. Bernhard, Todd Holden, C. Homes, N. Marinkovic, D.A. Walters, M.J. Casavant, J. Schmidt, R.E. Smalley, *Anisotropy of the optical conductivity and infrared-active optical phonons in magnetically aligned single wall carbon nanotubes*, *Bull. Am. Phys. Soc.* **46**, 887 (2001). March Meeting of the American Physical Society, Seattle, WA, March 12-16, 2001.

10. M. Strongin, J.J. Tu, C.C. Homes, S. Maslov, D.N. Basov, *Optical conductivity as a probe of the nature of ultra-thin layers*, Bull. Am. Phys. Soc. **46**, 1067 (2001). March Meeting of the American Physical Society, Seattle, WA, March 12-16, 2001.
11. C.C. Homes, T. Vogt, S.M. Shapiro, S. Wakimoto, *The infrared optical properties of $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$* , Bull. Am. Phys. Soc. **46**, 1142 (2001). March Meeting of the American Physical Society, Seattle, WA, March 12-16, 2001.
12. C.C. Homes, J.M. Tranquada and D.J. Buttrey, *Optical properties of $\text{La}_2\text{NiO}_{4+\delta}$ for $\delta=2/15$* , Bull. Am. Phys. Soc. **45**, 125 (2000). March Meeting of the American Physical Society, Minneapolis, MN, March 20-24, 2000.
13. J.M. Pigos, B.R. Jones, Z. Zhu, J.L. Musfeldt, C.C. Homes, J.A. Schleuter, B.H. Ward, U. Geiser, H.-J. Koo, M.-H. Whangbo, P.G. Nixon, R.W. Winter, G.L. Gard, and V.M. Yartsev, *Infrared and optical properties of $\beta'-(\text{ET})_2\text{SF}_5\text{CF}_3\text{SO}_3$: a new spin-Peierls material?*, Bull. Am. Phys. Soc. **45**, 856 (2000). March Meeting of the American Physical Society, Minneapolis, MN, March 20-24, 2000.
14. C.C. Homes, B.P. Clayman, D.A. Bonn, Ruixing Liang, and W.N. Hardy, *The effect of Ni impurities on the optical properties of $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$* , Bull. Am. Phys. Soc. **44**, 557 (1999). March Meeting of the American Physical Society, Atlanta, GA, March 20-26 (1999).
15. P.F. Henning, C.C. Homes, G.L. Carr, D.N. Basov, S. Maslov, and M. Strongin, *Infrared studies on the effects of localization in ultra-thin films*, Bull. Am. Phys. Soc. **44**, 1793 (1999). March Meeting of the American Physical Society, Atlanta, GA, March 20-26 (1999).
16. C.C. Homes, I. Isaac, Weimin Chen, and J.P. Franck, *The oxygen isotope effect on the optical properties of $\text{La}_{0.65}\text{Ca}_{0.35}\text{MnO}_3$ above and below the insulator-metal transition*, Bull. Am. Phys. Soc. **43**, 384 (1998). March Meeting of the American Physical Society, Los Angeles, CA, March 16-20 (1998).
17. M. Strongin, C.C. Homes, G.L. Carr, P.F. Henning, and D.N. Basov, *The nature of electronic states and ac conductivity in ultra-thin Pb films*, Bull. Am. Phys. Soc. **43**, 841 (1998). March Meeting of the American Physical Society, Los Angeles, CA, March 16-20, 1998.
18. A. McConnell, B.P. Clayman, C.C. Homes, M. Inoue, and H. Negishi, *Polarized reflectance measurements of the 2D charge-density-wave material Mo_4O_{11}* , Bull. Am. Phys. Soc. **43**, 919 (1998). March Meeting of the American Physical Society, Los Angeles, CA, March 16-20, 1998.
19. A.W. McConnell, B.P. Clayman, C.C. Homes, and M. Inoue, *Polarized reflectivity measurements of $\eta\text{-Mo}_4\text{O}_{11}$* , Physics in Canada **53**, 64 (1997). Annual Congress of the Canadian Association of Physicists, Calgary, AL, June 8-11, 1997.
20. C.C. Homes, B.P. Clayman, J.-L. Peng, and R.L. Greene, *The optical conductivity of a $\text{Nd}_{1.85}\text{Ce}_{0.15}\text{CuO}_4$ single crystal above and below T_c* , Bull. Am. Phys. Soc. **42**, 545 (1997). March Meeting of the American Physical Society, Kansas City, MO, March 17-21, 1997.
21. T. R  m, S. Moffat, T. Timusk, D. Basov, C.C. Homes, P. Roy, A. Naccura, R. Liang, D. Bonn, and W.N. Hardy, *An infrared study of the interplane conductivity in Zn and Ni doped $\text{YBa}_2\text{Cu}_3\text{O}_{6.6}$* , Bull. Am. Phys. Soc. **42**, 482 (1997). March Meeting of the American Physical Society, Kansas City, MO, March 17-21, 1997.
22. A.W. McConnell, X.-Z. Wang, C.C. Homes, and B.P. Clayman, *Reflectance measurements on $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8-\delta}$ crystals doped with Zn and Y*, Bull. Am. Phys. Soc. **41**, 728 (1996). March Meeting of the American Physical Society, St. Louis, MO, March 18-22, 1996.
23. C.C. Homes, P.J. Horoski, B.P. Clayman, M.L.W. Thewalt, and T.R. Anthony, *Isotopic behavior of the F_u modes in single crystal C_{60}* , Bull. Am. Phys. Soc. **40**, 101 (1995). March Meeting of the American Physical Society, San Jose, CA, March 20-24, 1995.

24. Q. Song, C.C. Homes, B.P. Clayman, D.A. Bonn, R. Liang, and W.N. Hardy, *Optical properties of $YBa_2-(Cu_{1-x}Ni_x)3O_{6.95}$, for $x=0 \rightarrow 1.4\%$* , Bull. Am. Phys. Soc. **40**, 692 (1995). March Meeting of the American Physical Society, San Jose, CA, March 20-24, 1995.
25. C.C. Homes, *Pseudogap in c -axis optical conductivity of oxygen-reduced $YBa_2Cu_3O_{6+x}$* , Bull. Am. Phys. Soc. **39**, 580 (1994). March Meeting of the American Physical Society, Pittsburgh, PA, March 21-25, 1994.
26. T. Timusk, C.C. Homes, R. Liang, D.A. Bonn, and W.N. Hardy, *Optical phonon spectra of $YBa_2Cu_3O_{6.70}$ along the c axis*, Bull. Am. Phys. Soc. **39**, 656 (1994). March Meeting of the American Physical Society, Pittsburgh, PA, March 21-25, 1994.
27. C.C. Homes, T. Timusk, R. Liang, D.A. Bonn, and W.N. Hardy, *Optical properties along the c axis of $YBa_2Cu_3O_{6+x}$, for $x=0.70, 0.80, 0.85, 0.90$ and 0.95* , Physics in Canada **49**, 66 (1993). Annual Congress of the Canadian Association of Physicists, Vancouver, B.C., June 13-16, 1993.
28. J.E. Eldridge, C.C. Homes, A.M. Kiri, H.H. Wang and J.M. Williams, *The effect of ^{13}C isotopic substitution on the polarized infrared conductivity spectra of $\kappa-(BEDT-TTF)_2Cu[N(CN)_2]Br$* , Gordon Research Conference on Organic Superconductors, Il Ciocco, Italy, May 9-14, 1993.
29. C.C. Homes, N. Cao, T. Timusk, R. Liang, and W.N. Hardy, *Optical conductivity of $YBa_2Cu_3O_{7-\delta}$ along the c axis for $\delta=0.05, 0.1$ and 0.15* , Bull. Am. Phys. Soc. **38**, 227 (1993). March Meeting of the American Physical Society, Seattle, WA, March 22-26, 1993.
30. C.C. Homes, N. Cao, T. Timusk, R. Liang and W.N. Hardy, *Optical conductivity of $YBa_2Cu_3O_{7-\delta}$ along the c axis*, Physics in Canada **48**, 85 (1992). Annual Congress of the Canadian Association of Physicists, Windsor, Ont., June 14-17, 1992.
31. N. Cao, C.C. Homes, T. Timusk, R. Liang and W.N. Hardy, *Optical phonons in $YBa_2Cu_3O_{7-\delta}$ along the c -axis*, Physics in Canada **48**, 86 (1992). Annual Congress of the Canadian Association of Physicists, Windsor, Ont., June 14-17, 1992.
32. X. Wu, C.C. Homes, T. Timusk, B.D. Biggs, F.S. Pierce, and S.J. Poon, *Optical conductivity of the icosahedral quasicrystal $Al_{75.5}Mn_{20.4}Si_4$ and its crystalline approximant $Al_{72.5}Mn_{17.4}Si_{10.1}$* , Physics in Canada **48**, 91 (1992). Annual Congress of the Canadian Association of Physicists, Windsor, Ont., June 14-17, 1992.
33. N. Cao, C.C. Homes, T. Timusk and R. Liang, *Optical conductivity of $YBa_2Cu_3O_{7-\delta}$ along the c axis*, Bull. Am. Phys. Soc. **37**, 282 (1992). March Meeting of the American Physical Society, Indianapolis, IN, March 16-20, 1992.
34. C.C. Homes, X. Wu, T. Timusk, Z. Altounian, A. Sahnoune, J.O. Ström-Olsen, B.D. Biggs, F.S. Pierce, and S.J. Poon, *Optical conductivity of the icosahedral quasicrystals $Al_{63.5}Cu_{24.5}Fe_{12}$ and $Al_{65}Cu_{20}Ru_{15}$* , Bull. Am. Phys. Soc. **37**, 616 (1992). March Meeting of the American Physical Society, Indianapolis, IN, March 16-20, 1992.
35. C.C. Homes and J.E. Eldridge, *Optical properties of the organic conductors $(TMTSF)_2ReO_4$ and $(TMTSF)_2BF_4$ above and below their metal-insulator transitions compared with model calculations*, Bull. Am. Phys. Soc. **36**, 822 (1991). March Meeting of the American Physical Society, Cincinnati, OH, March 18-22, 1991.
36. C.C. Homes and J.E. Eldridge, *The optical properties of $(TMTSF)_2ReO_4$ and $(TMTSF)_2BF_4$ through the metal-insulator transition*, Bull. Am. Phys. Soc. **33**, 786 (1988). March Meeting of the American Physical Society, New Orleans, LA, March 21-25, 1988.
37. J.E. Eldridge and C.C. Homes and G.S. Bates, *Far-infrared optical properties of some organic conductors and superconductors*, Bull. Can. Assoc. Phys. **41**, 48 (1985). Canadian Association of Physicists Congress, Fredericton, N.B., Canada, June 24-26, 1985.

38. C.C. Homes, J.E. Eldridge and G.S. Bates, *Far-infrared powder absorption spectra of some (TMTSF)₂X salts*, Bull. Am. Phys. Soc. **30**, 635 (1985). March Meeting of the American Physical Society, Baltimore, MD, March, 1985.
39. C.C. Homes and T.J. Hughes, *An evaluation of numerical methods to infer ionospheric currents from MAGSAT data*, EOS **63**, 1079 (1982), Fall Meeting of the American Geophysical Union, San Francisco, CA, December 7-15, 1982.

Invited Seminars and Colloquia

Energy scales in High- T_c Superconductors (invited talk), International Conference on Dynamic Inhomogeneities in Complex Oxides and Related systems, 14-20 June 2003, Bled, Slovenia.

Optical conductivity sum rules and kinetic energy mechanisms in high- T_c materials, (R.G. Herb Materials Physics Seminar), University of Wisconsin, Madison, WI, 26 February 2003.

The role of phonons in high-temperature superconductivity – is there one? (invited talk), International Conference on the Low Energy Electrodynamics in Solids (LEES 02), 13-18 October 2002, Montauk (Long Island), NY.

Optical properties of the giant dielectric materials $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ and $\text{CdCu}_3\text{Ti}_4\text{O}_{12}$, (invited symposium), March Meeting of the American Physical Society, Indianapolis, IN, March 18-22, 2002.

Optical properties of cuprate superconductors and related materials, (invited talk), VII International Conference on Advanced Materials, Cancun, Q.R., Mexico, August 26-30, 2001.

Infrared spectroscopy at the National Synchrotron Light Source, (Keynote talk), Canadian Light Source: 3rd Users' Meeting, Infrared Spectroscopy and Microscopy Workshop, University of Saskatchewan, Saskatoon, Canada, November 17-18, 2000.

Infrared studies of correlated systems at very long wavelengths at the NSLS, Future Directions for Far-Infrared Sources, 2000 ALS Users' Meeting Workshop, October 18, 2000.

Screening effects in high-temperature superconductors, University of Connecticut (Storrs), Physics Colloquium, February, 2000.

Charge transport and screening effects in the high-temperature superconductors, National Synchrotron Light Source Annual Users Meeting, Complex Materials Workshop, May 24-26, 1999.

Charge transport and screening effects in cuprate superconductors, NSLS lunch-time seminar, May, 1999.

Charge transport and the optical properties of cuprate superconductors, Asia Pacific Center for Theoretical Physics Winter Workshop on Strongly Correlated Electron Systems, Bokwang Pheonix Park, Kangwon-do, Korea, February 8-13, 1999.

Infrared spectroscopy of solids, SUNY at Binghamton, Chemistry Colloquium, November, 1997.

The effect of impurities on the optical properties of $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$, SUNY at Stony Brook, Solid State Seminar, April, 1997.

Possible density-of-states effects in Ni-doped $\text{YBa}_2\text{Cu}_3\text{O}_{6.95}$, McMaster University, Superconductivity Study Group, September, 1995.

March Meeting of the American Physical Society, Condensed Matter Physics, *Pseudogap in the c-axis optical conductivity of oxygen-reduced $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$* , March, 1994.

Aspen Winter Condensed Matter Physics Conference, High-Temperature Superconductors and Related Materials, *Optical properties along the c-axis of $YBa_2Cu_3O_{6+x}$ for $x=0.6 \rightarrow 0.95$* , January, 1994.

University of British Columbia, Condensed Matter Seminar, *Optical properties along the c-axis of $YBa_2Cu.O_{6.70}$: evidence for a pseudogap*, March, 1993.

University of British Columbia, Condensed Matter Seminar, *Optical Properties of Quasicrystals*, September, 1992.

Cornell University, Lunch-Time Seminar, *The optical conductivity of the icosahedral quasicrystals $AlCu(Fe,Ru)$, and $AlMnSi$ and its crystalline approximant*, July, 1992.

Canadian Institute for Advanced Research, Superconductivity Meeting, *Electron-phonon coupling in organic conductors and superconductors*, January, 1991.

McMaster University, Superconductivity Study Group, *Electron-phonon coupling in the conducting organic $(TMTSF)_2X$ salts*, October, 1990.

Conference Organization

Program Committee, International Conference on the Low Energy Electrodynamics in Solids (LEES '02), Montauk, New York, October 14-18, 2002.

Committee Memberships

- Chair, Colloquium and Condensed Matter Seminar Committee
- Condensed Matter Physics Future Committee
- Computer Security Liaison and System Administration

Professional Activities

- Local contact, NSLS Beamline U10A
- Referee: Nature, The Physical Review B and Physical Review Letters, Canadian Journal of Physics, Physica Status Solidi
- External Reviewer: National Science Foundation, The Royal Society of New Zealand

Contributed Talks

Pittcon, *FTIR Spectroscopy*, New Orleans, LA, March 17-22, 2002 (paper presented).

March Meeting of the American Physical Society, *Condensed Matter*, Seattle, WA, March 12-16, 2001 (papers presented).

March Meeting of the American Physical Society, *Condensed Matter*, Atlanta, GA, March 20-26, 1999 (papers presented).

Gordon Conference on Condensed Matter Physics, *Correlated Electron Systems*, Plymouth, NH, July 19-24, 1998 (papers presented).

National Synchrotron Light Source Annual Users Meeting, Upton, NY, May 18-20, 1998 (poster session).

March Meeting of the American Physical Society, *Condensed Matter*, Los Angeles, CA, March 16-20, 1998 (papers presented).

Spectroscopy of Novel Superconductors, September 14-18, 1997, Cape Cod, Massachusetts (poster sessions).

March Meeting of the American Physical Society, *Condensed Matter*, Kansas City, MO, March 17-21, 1997 (papers presented).

SPIE International Symposium on Lasers and Integrated Optoelectronics (Spectroscopic Studies of Superconductors), San Jose, CA, January 27 - February 2, 1995 (paper presented).

March Meeting of the American Physical Society, *Condensed Matter*, San Jose, CA, March 20-24, 1994 (papers presented).

Canadian Institute for Advanced Research, *Superconductivity Meeting*, Hamilton, Ontario, February 25-27, 1993 (paper presented).

Canadian Association of Physicists Annual Congress, Simon Fraser University, Burnaby, B.C., June 16-19, 1993 (paper presented).

March Meeting of the American Physical Society, *Condensed Matter*, Seattle, Washington, USA, March 22-26, 1993 (paper presented).

Canadian Association of Physicists Annual Congress, *Superconductivity Symposium*, University of Windsor, Ontario, June 15-17, 1992 (poster sessions).

March Meeting of the American Physical Society, *Condensed Matter*, Indianapolis, Indiana, USA, March 16-20, 1992 (paper presented).

Gordon Research Conference on Condensed Matter Physics, *Magnetism and Superconductivity*, Wolfeboro, New Hampshire, USA, June 10-14, 1991 (poster session).

March Meeting of the American Physical Society, *Condensed Matter*, Cincinnati, Ohio, USA, March 18-22, 1990 (paper presented).

March Meeting of the American Physical Society, *Condensed Matter*, New Orleans, Louisiana, USA, March 21-25, 1988 (paper presented).

Low-Dimensional Conductors and Superconductors, NATO Advanced Study Institute, Magog, P.Q., Canada, August 24-September 6, 1986.

March Meeting of the American Physical Society, *Condensed Matter*, Baltimore, Maryland, USA, March, 1985 (paper presented).

Honours and Awards

1992-1994	Natural Sciences and Engineering Research Council (NSERC) of Canada, Postdoctoral Fellowship, Simon Fraser University
1989-1990	University Graduate Fellowship, University of British Columbia
1987-1988	British Columbia Government Scholarship, University of British Columbia
1983-1985	NSERC Postgraduate Scholarship, University of British Columbia
1982-1983	NSERC University Summer Research Award, McMaster University
1979-1980	Chancellors Scholarship, McMaster University

Memberships in Professional Societies

- 1985- American Physical Society, member.
- 1985- Canadian Association of Physicists, member.
- 2000- American Association for the Advancement of Science, member.